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GEOLOGIC ACTIVITIES IN SOUTH CAROLINA DURING 1963

By

Henry S. Johnson, Jr. ^{1/}

During 1963 the Division of Geology, S. C. State Development Board, continued its basic program of investigations of the geology and mineral resources of the State. Personnel consisted of one full time geologist, one geologic secretary, a ceramic consultant, one part time draftsman, one part time field assistant, and nine part time project geologists. In addition, a cooperative program of ground water investigations was carried on under the direction of G. E. Siple, U. S. Geological Survey.

According to a preliminary statement issued by the U. S. Bureau of Mines, mineral production in South Carolina in 1963 totaled about \$36,000,000, a 9 percent increase over value in 1962 and an all time high record. Table 1 gives comparative figures for 1962 and 1963. The 1962 data are based on complete returns and the 1963 data on preliminary reports from the mineral producers of the State. These preliminary reports indicate increased production of masonry cement, sand and gravel, kyanite, clays (both kaolin and miscellaneous), stone, pyrite, and barite in 1963. Decreases are indicated for portland cement and scrap mica. Production of peat, vermiculite, and dimension granite remained about the same as for 1962.

Estimates from producers and other sources indicate that South Carolina, as in 1962, continued to rank second in the nation in the output of kaolin, kyanite, and vermiculite.

Table 1.--Mineral production in South Carolina ¹

Mineral	1962		1963 ²	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays.....thousand short tons.....	1,518	\$7,165	1,650	\$7,863
Sand and gravel.....do.....	3,318	3,670	3,755	4,296
Stone.....do.....	6,382	10,066	6,742	10,652
Value of items that cannot be disclosed:				
Barite, cement, feldspar (1962), gem stones (1962), kyanite, scrap mica, peat, pyrites, and vermiculite.	- - - -	13,000	- - - -	12,747
Total South Carolina.....	- - - -	33,901	- - - -	35,558

(1) Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

(2) Estimated from producers' reports and other sources.

^{1/} State Geologist, Division of Geology, S. C. State Development Board

PROJECTS

The following remarks serve as an index to projects carried on during 1963 by the Division of Geology or with its cooperation and support.

(1) Mineral industry of South Carolina (Mrs. Camilla McCauley). -- Continuing library research to assemble available information on the mineral industry of South Carolina from the Colonial Period to the present. Commodity reports are published in the bulletin series. A report on barite (Bull. 27) has been released; and manuscripts are now being edited for the corundum, gem stones, manganese, and gold reports. Work is now in progress on mica and peat.

(2) Geology and mineral resources of Newberry County, S. C. (J. F. McCauley). -- Report in hands of editor. To be published in bulletin series.

(3) Geology and mineral resources of Pickens County, S. C. (C. Q. Brown). -- Field and laboratory work complete. Report in preparation for bulletin series.

(4) Clays and opal-bearing claystones of the South Carolina Coastal Plain (S. D. Heron, Jr., G. C. Robinson, and H. S. Johnson, Jr.). -- Field work essentially complete. Manuscript in preparation. To be published in bulletin series.

(5) Geology and mineral resources of Orangeburg County, S. C. (W. K. Pooser). -- Field and laboratory work complete. Report in preparation for bulletin series.

(6) Geology of the Blythewood 7 1/2' quadrangle, S. C. (W. D. Parades and J. F. McCauley). -- Field work complete. Map and text in hands of editor. To be published in MS series.

(7) Geology of the Blaney 7 1/2' quadrangle, S. C. (D. C. Ridgeway and J. F. McCauley). -- Field work complete. Map and text in hands of editor. To be published in MS series.

(8) Geology and mineral resources of Edgefield County, S. C. (W. T. McCutchen and H. S. Johnson, Jr.). -- Field work about 90 percent complete. To be published in bulletin series.

(9) Geology of the SW quarter of the Eutawville 15' quadrangle, S. C. (D. A. Duncan). -- Field work complete. Map and report in preparation for publication in Geologic Notes.

(10) Geology of the Eutawville 15' quadrangle, S. C. (D. J. Colquhoun). -- Field work essentially complete. Map and text in preparation for publication in MS series.

- (11) Geology of the SE quarter of the St. Matthews 15' quadrangle, S. C. (Phoebe Bernat). -- Field and laboratory work complete. Emphasis on sedimentary petrology and heavy mineral distribution.
- (12) Geology and mineral resources of York County, S. C. (J. R. Butler). -- Field and laboratory work essentially complete. Report in preparation for publication in bulletin series.
- (13) Geology and mineral resources of Oconee County, S. C. (C. J. Cazeau). -- Field and laboratory work complete. Report in preparation for bulletin series.
- (14) Geology of the Clemson 7 1/2' quadrangle, S. C. (C. Q. Brown and C. J. Cazeau). -- Field work complete. Map and text in hands of editor. To be published in MS series.
- (15) Geology of the Sumter West 7 1/2' quadrangle (C. Q. Brown). -- Field work and power auger drilling complete. Map and text in preparation for publication in MS series.
- (16) Geology and mineral resources of Horry County, S. C. (J. R. Du Bar). -- Field work about 75 percent complete.
- (17) Geology of the Irmo NE 7 1/2' quadrangle, S. C. (D. T. Secor and W. E. Bright). -- Field work about 90 percent complete.
- (18) Geology of the LaFrance 7 1/2' quadrangle, S. C. (C. J. Cazeau). -- Field work complete. Map and text in hands of editor. For publication in MS series.
- (19) Geology of the Wampee quadrangle, S. C. (J. R. Du Bar). -- Field work about 90 percent complete. To be published in MS series.
- (20) Geology of the Myrtle Beach 15' quadrangle (J. R. Du Bar). -- Field work about 75 percent complete. To be published in MS series.
- (21) Geology of the James Island 7 1/2' quadrangle (C. J. Cazeau). -- Field work complete. Report in preparation for publication in MS series.
- (22) Geology and mineral resources of Anderson County, S. C. (David S. Snipes). -- Field work to begin in July 1964.

SHORTER INVESTIGATIONS

(1) Mine and surface mapping carried on in the Smyrna gold district, York County, by J. R. Butler and H. S. Johnson, Jr., as an adjunct of the York County project. A short report on the gold district is being prepared by Butler.

(2) Power auger drilling by the Division of Geology in Jasper and Beaufort Counties indicates fairly extensive deposits of phosphorite sands in the Hawthorne Formation. Phosphate content ranges from about 1 to 10% P_2O_5 . There is some indication that somewhat higher grade, re-worked phosphate deposits may be present under marsh areas.

(3) Marine geology study on a one day cruise sponsored by the Bears Bluff Laboratories indicated the presence of drowned bars on the sea floor off the mouth of the North Edisto River. These appear to be "Pamlico" beaches that have been flooded but not destroyed by rising post-Wisconsin seas.

(4) Sampling and laboratory testing of clay and shale from the Parksville area, McCormick County, indicate abundant resources of material well suited for the production of quarry tile and other ceramic products.

(5) Drilling in the Sumter West quadrangle shows a facies relationship between the Tuscaloosa and Black Creek Formations in this area. Also, about 150' of surface and subsurface relief is present along the Orangeburg Scarp in the northwest part of the quadrangle.

(6) Drilling in the James Island Quadrangle indicates the presence of the Cooper Marl everywhere in the area at depths of not more than 75'. The Cooper is overlain by sand, clay, and shell marl of the "Pamlico" Formation. In the southeastern part of the quadrangle the "Pamlico" contains sub-ore grade phosphorite sands at depths of 50 to 75' and is characterized by a petroliferous odor.

(7) Drilling in the Myrtle Beach and Wampee quadrangles failed to find potentially commercial oyster shell deposits but did result in the discovery of a large clay deposit in the vicinity of the Intracoastal Waterway between Myrtle Beach and Socastee. The clay in the location is well suited for a plant to produce facsimile Colonial handmade brick.

(8) Investigations of Pleistocene "coquina" deposits in coastal areas of the Carolinas indicate that they may be divided into (a) longshore current deposits on the seaward edge of barrier bars, (b) storm or surf zone accumulations in bars, and (c) inlet deposits.

Longshore "coquina" deposits are typified by the outcrops at 20th Avenue South, Myrtle Beach, and at Fort Fisher, North Carolina. Where exposed above water these deposits characteristically exhibit well developed festoon cross-bedding. The parts of the outcrops that are only rarely above water have a rough, knobby surface and appear structureless. These parts are thought to have formed under similar conditions, however, and may well possess the same sedimentary structures.

Cementation of the "coquina" deposits probably took place at a time of lower sea level, when weathering of the shelly sands caused solution and redeposition of calcium carbonate.

Other "coquina" deposits may be present in association with ancient offshore bars at higher levels in the Coastal Plain.

(9) Work in eastern Horry County has so far failed to show clearly the existence of a 25 foot Pleistocene sea level (i. e., the "Pamlico" shore). "Pamlico" marine deposits interfinger with fresh and brackish water deltaic deposits in the area of the Conway embayment. Evidence in the area suggests water levels were 30 to 50' above present sea level.

REPORTS

During 1963 the Division of Geology published Bulletin 28, Limestone Resources of the Coastal Plain of South Carolina, 128 pages. Price \$1.50.

During 1963 the following papers were published in Geologic Notes:

- Vol. 7, Nos. 1 & 2. -- (1) Geologic activities in South Carolina during (January-April) 1962 - H. S. Johnson, Jr.
(2) Spectro-geochemical exploration near Donalds, S. C. - A test - C. Q. Brown
- Vol. 7, Nos. 3 & 4. -- (1) Geology and structure of the Pendleton - La France area, northwestern South Carolina - C. J. Cazeau
(2) Occurrence of bismuth at the Brewer Mine, Chesterfield County, S. C. - Priscilla Mount
(3) The refraction seismograph as a geologic tool in the Coastal Plain of South Carolina - D. J. Colquhoun
- Vol. 7, No. 5. -- Guide to the geology of Pickens and Oconee Counties, South Carolina -- Carolina Geological Society field trip October 26-27, 1963 - C. J. Cazeau and C. Q. Brown
(September-October)

- Vol. 7, No. 6. -- (1) Radiocarbon dates from Botany Bay Island,
(November-December) South Carolina - James Neiheisel
(2) South Carolina bentonite as an extrusion aid -
G. C. Robinson

GOLD MINING IN SOUTH CAROLINA, WITH SPECIAL REFERENCE TO YORK COUNTY

By

James Robert Butler ^{1/}

ABSTRACT

Gold was discovered in South Carolina before 1802, and the first bullion was shipped to the mint in 1829. Recorded production from 1829 to the present totaled 318,825 ounces, or a value of \$11,158,875 if calculated at \$35 per ounce. The three principal periods of gold mining activity were 1830-1861, 1880-1910, and 1935-1942. Production was stopped by Government order in 1942 because of World War II. The principal mines are the Haile mine, Lancaster County; the Dorn mine, McCormick County; and the Brewer mine, Chesterfield County. Production from these three mines has been about \$6,500,000, \$900,000, and \$450,000 respectively. York County, with a number of small mines, is probably the next most important gold producing county. South Carolina gold deposits may be divided into (1) large tonnage, low grade disseminated deposits such as the Haile, (2) relatively high grade quartz veins, generally less than 10 feet thick, and (3) placer deposits of free gold in stream gravels or colluvium. Each type of deposit requires different methods of exploration, development, and production. The future of gold mining in South Carolina remains uncertain. Most of the deposits have not been explored by modern means, and the State's gold potential has not been adequately tested.

INTRODUCTION

There has been very little gold mining activity in South Carolina since 1942, when the mines closed on government order. The purpose of the order was to shift emphasis to production of base metals for wartime needs. Since the war, there have been only sporadic attempts to re-open the mines. Because of increasing foreign demands on gold reserves of the United States and speculation about an increase in the price of gold, there is a possibility of renewed activity in South Carolina. The purpose of this report is to review briefly the history of gold mining in South Carolina, especially in York County, and to discuss some of the factors involved in future gold production in the State.

This report was prepared as a byproduct of field, laboratory, and library research connected with the York County Mineral Resources Survey, a joint project of the York County Mineral Resources Study Commission and the Division of Geology, South Carolina State Development Board.

^{1/} Assistant Professor of Geology, University of North Carolina, Chapel Hill

HISTORY OF GOLD MINING IN SOUTH CAROLINA

The total recorded production of gold in South Carolina amounts to 318,825 ounces (Minerals Yearbook, 1960, v. 3, p. 917), or a value of \$11,158,875 if calculated at \$35 per ounce. Since there are no accurate records for the earliest periods of mining, the actual production may be more than a million dollars higher. The Haile mine, Lancaster County, has produced about \$6,500,000 of the total; therefore, the history of gold production in the State is largely a reflection of activity at the Haile mine.

Gold was discovered in Cabarrus County, North Carolina, in 1799 and in the Greenville district of South Carolina before 1802 (Pardee and Park, 1948, p. 27). The Brewer mine, Chesterfield County, South Carolina, was one of the first gold workings in the State, as development work started there in 1828 (Sloan, 1908, p. 75). Work on the Haile property started in 1829.

The first gold bullion from South Carolina was sent to the mint in 1829. Figure 1 shows recorded gold production from 1829 to the present. There are three main periods of production in South Carolina: 1830-1861, 1880-1910, and 1935-1942. No gold production is reported for the years 1863-1865, 1918-1925, 1927, 1929, 1930, and from 1944 to the present.

During the 1830-1861 period of production, a large percentage of the gold was probably produced from placer deposits. It is likely that production of gold in this early period was much higher than shown in Figure 1, because there is no accurate record of the amount of gold shipped abroad, put in circulation by private coinage, or used in other ways. It has been estimated that only half of the gold production in the U. S. from 1804 to 1865 was reported to the mint (Pardee and Park, 1948, p. 28-29). Operations were almost completely suspended during the War Between the States and there was little gold production after the war until 1880.

The second period of gold production reflects the renewed activity at the Haile mine. From 1888 until 1908, the Thies chlorination process for treating low-grade ore made it possible for the Haile mine to be the leading gold producer in the South (Pardee and Park, 1948, p. 113).

Gold mining activity declined before World War I and remained almost negligible until 1934. The price of gold before 1933 was \$20.67 per ounce. In January 1934 the price of gold at the U. S. Mint was set at \$35 per ounce, resulting in stimulated exploration and activity that continued until curtailed by World War II.

Work at the Haile mine began again in 1934, but there was little production of gold until completion of a large cyanide plant in June 1937. From 1937 to 1942 the Haile was the principal producer of gold in South Carolina and the eastern United States. In 1939 South Carolina produced 13,833 ounces of gold, of which 13,551 ounces were from the Haile mine (Minerals

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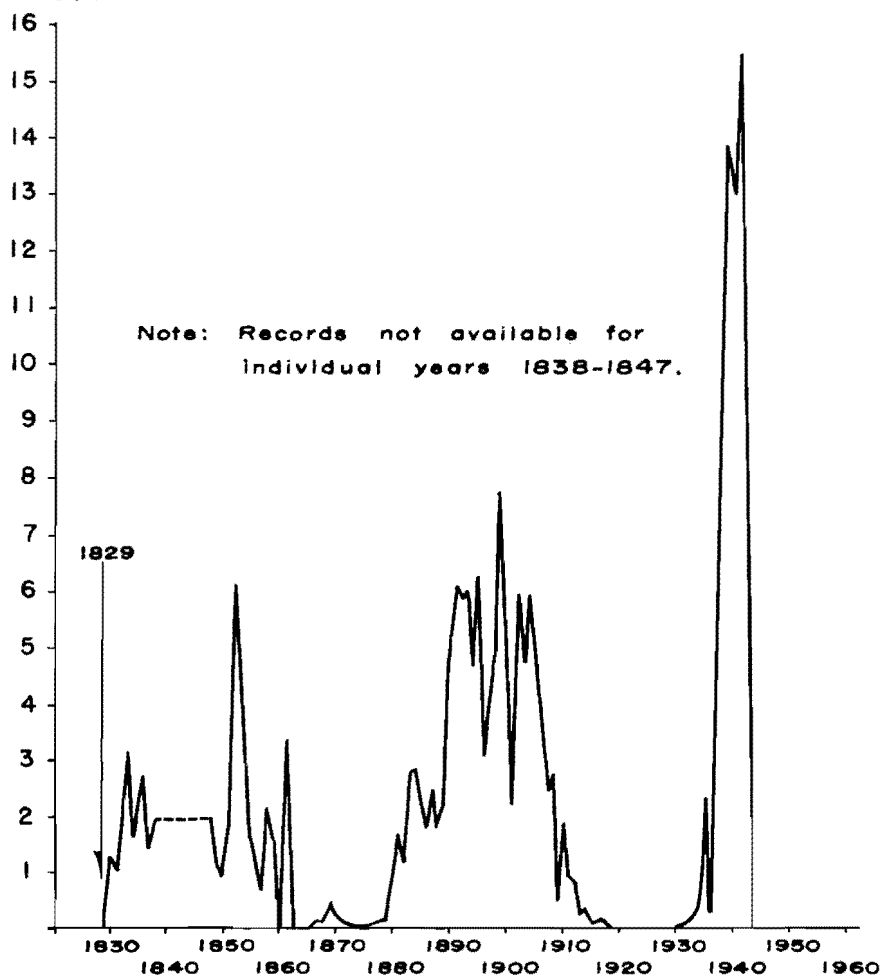


Fig. 1. Gold production in South Carolina, 1829-1962

Yearbook for 1939, p. 288, 293). During the period 1829-1940, gold from the Haile mine amounted to \$5,811,660 (Minerals Yearbook, 1940, p. 322) and the total was well over \$6,000,000 when the mine closed in October, 1942. A reasonable estimate is \$6,500,000. The maximum production of gold in South Carolina in any one year was 15,508 ounces (worth \$542,780) in 1941 (Minerals Yearbook, 1941, p. 324). Because of the forced closing of gold mines in 1942, production in South Carolina declined drastically from 7,824 ounces in 1942 to 147 ounces in 1943; there has been no recorded production since 1943. The 1943 total of 147 ounces was probably derived from 156 tons of ore shipped from the Southern Gold (Terry) mine, Cherokee County, (Minerals Yearbook, 1943, p. 351).

Because of the lack of accurate records of gold production before 1865, it is difficult to rank mines and counties in order of total production. According to estimates of Pardee and Park (1948, p. 106, 113, 119) and later records (Minerals Yearbook, 1935-1960), the following three mines and counties have the largest total production in South Carolina:

Haile mine, Lancaster County	-	\$6,500,000
Dorn mine, McCormick County	-	900,000
Brewer mine, Chesterfield County	-	450,000

(Note: figures include recorded production plus estimates of production not reported to the mint)

Even though there is no accurate estimate of production of early mines in York County, such as the Martin, Darwin, and Smith, it is likely that York ranks fourth in South Carolina, behind the three counties listed above. Cherokee County probably ranks fifth, mainly because of production from the Terry (Southern Gold) mine.

During the period 1901 to the present, the following mines were the leading producers in South Carolina (Minerals Yearbook, 1960, v. 3, p. 917):

<u>Mine</u>	<u>County</u>	<u>Total gold production</u>
Haile	Lancaster	\$2,875,244
Terry	Cherokee	136,725
Horn	York	27,522
Blackman	Lancaster	18,741
Dorothy	York	16,934
Terry	York	15,190
Brewer	Chesterfield	14,776
Darwin	York	10,009

South Carolina has not been a major producer of gold nor has gold mining played a major part in the economy of the State, except perhaps during the earliest days of gold mining in the Southeast before the War Between the States. Before the discovery of gold in California in 1848, the Southeast produced most of the domestic bullion. Branches of the U. S. Mint were established in Charlotte, North Carolina, and in Dahlonega, Georgia, in 1838.

After 1848, the western United States, and later Alaska, quickly surpassed the Southeastern States in gold output. Famous old mines like the Haile, the largest producer in the eastern United States, were eclipsed by some of the large mines in the West. For example, South Dakota's Homestake mine, which is the most productive gold mine in the Western Hemisphere, yielded 25,000,000 ounces of gold valued at \$875,100,000 from 1875 until 1960 (Minerals Yearbook, 1960, p. 507).

Among the Southeastern States, North Carolina ranks first, Georgia second, and South Carolina third in total gold production. Less glamorous mineral commodities such as clay and stone outstrip gold in production value in South Carolina. For example, during the single year 1962, the value of stone produced in the State was \$10,066,000 (Minerals Yearbook, 1962), which exceeds the total recorded gold production since 1829 by a considerable margin.

YORK COUNTY AND EASTERNMOST CHEROKEE COUNTY

York County has about 40 gold mines, nearly twice as many as any other county in South Carolina. Most of the mines are small ones, having produced only a few carloads or less of gold ore. Production has been mainly from quartz veins, which are generally less than five feet in thickness, and from placer deposits. About three-fourths of the mines are located in the vicinity of Smyrna and Hickory Grove, in western York County. In this region, quartz veins are very numerous and occur in several nearly parallel groups in which the veins generally have northeasterly trends. Several of the veins cross into easternmost Cherokee County, north of Smyrna. Because several of the Cherokee County mines are located on veins that are extensions of the major groups in York County, the mines are included in this report.

Gold mines in York County were probably worked within a few years after the first gold production in South Carolina was recorded in 1829. Lieber (1844, p. 25; 1848, p. 124) reported the presence of gold mines, some of which were abandoned, on Moor's Creek (now called Guyonmoore Creek) and on Allison Creek. These mines were probably at or near the location of the Magnolia (Smith) mine, two miles west of Hickory Grove, and the Wilson mine, 6 miles northeast of York.

The Martin mine, about one mile west of Smyrna, was first worked in 1836 or 1838 by Daniel Smith and Dawkins (Lieber, 1856, p. 75-76). Lieber reported that gold nuggets weighing 17 and 9 1/2 ounces were found at the Martin mine and also large pieces of quartz were found that contained 210 pennyweights (10.5 ounces) and 4000 pennyweights (200 ounces) of gold. Local people in the Smyrna area still tell of the discovery of the Sheepshead Nugget, a 27 pound specimen of gold and quartz, which was found in the field just north of the Martin mine. Lieber's report seems to support the story of the Sheepshead Nugget.

The Martin mine was developed in a placer bed of gravel and clay several feet thick overlying weathered rock with gold-bearing quartz stringers. The gravel bed extended over four acres (Lieber, 1856, p. 75). According to Sloan (1908, p. 47), the Martin mine probably had the largest output of gold ever derived from a bed of this type in South Carolina. There is no way of estimating the total production. The mine has been worked intermittently since the initial development, the last period probably being around 1915.

The Darwin mine, 3 miles west-southwest of Smyrna, had been worked for some years before Lieber's survey (Lieber, 1858, p. 56-57). The mine was also worked at two different periods in later years. Production for 1909-1910 was 201 ounces.

Lieber (1856, p. 46) reported that the Smith (Magnolia) mine had been abandoned for a number of years; however, it was reopened several times during later years. By the time of Graton's survey (Graton, 1906, p. 105) a total of four mills had been built on the property at different times.

During Lieber's two surveys (1856, 1858) the following mines were active or recently closed: Wilson, Mary, Sutton, Martin, Darwin, and Wylie (not located during the present survey).

The advent of the War Between the States brought mining activity to a standstill and there was little recovery until 1880. The following mines were in production at various times during the period 1880-1910: Darwin, Ferguson, McGill, Hardin, Ross-Carroll, McCaw, Horn, Schlegelmilch, Dorothy, Brown, Wilson, Cal Parker, Barnett, Magnolia, Allison (Dickey), McCarter, Logan, Patterson, Wright, and Wallace in York County; and the Terry, Wallace, and Love (Bustis) in Cherokee County (Graton, 1906; Sloan, 1908; Keith and Sterrett, 1931; Pardee and Park, 1948).

Mining activity declined again about 1910 and remained at a low level until stimulated by the increase in the price of gold in 1934. In 1915, the Horn mine at Smyrna was the largest (and nearly the only) producer of gold in the State.

Mines active in the years 1934-1943 include the following: Dickey, Magnolia, Dorothy, Ross-Carroll, Wheat, and Quinn in York County; and Bar Kat (McGill), Wallace, Southern Gold (Terry), Dixon, and Eustis (Love) in Cherokee County (Pardee and Park, 1948; Minerals Yearbooks 1934 and 1943).

Since the end of World War II, there has been intermittent activity in the mining district, mainly leasing and small-scale exploration, but no significant production. In 1961, Glenn C. Rathburn announced the discovery of placer gold at the Thunderhead prospect on the Ollie Proctor property, 2 miles southeast of Hickory Grove. A small amalgamation outfit was built by 1963 to treat the concentrates. In 1962, the Southern Gold mine was opened and de-watered by Fox Lake Mines of Canada, and the mine was sampled. The Mary mine was de-watered by H. M. Armstrong and Charles Whitesides in 1961 and examined.

Since 1961, Cockburn Grubstake Syndicate and Dixie-Carolina Venture, under the direction of Frank Cockburn and Frank Mills, have been active in the area. During 1963 an old shaft, now called the Dixie-Carolina shaft, on the Ross-Carroll property was opened and extended to a depth of about 55 feet. Milling equipment with the capacity of 50 tons of ore per day is being erected on Wolf Creek, but has not been completed at the time of this writing (December 1963).

POTENTIAL FOR GOLD PRODUCTION

Gold in South Carolina has been produced from three general types of deposits: (1) low-grade disseminated deposits of very large tonnage, such as the Haile, (2) relatively high-grade quartz veins, generally less than ten feet thick, in which gold values are largely restricted to the vein material, and (3) placer deposits of free gold in stream gravels and other surficial material. Each of the three types requires different methods of exploration, development, and production. Any potential deposit must be surveyed, mapped, and sampled by techniques suited to the particular type of deposit.

The Haile ore bodies offer the best examples of large low-grade disseminated deposits. The ore is a fine-grained, hard, siliceous rock with disseminated pyrite occurring in irregular bodies between 50 and 100 feet wide and several hundred feet in length (Pardee and Park, 1948, p. 114-115). Much of the ore averaged less than \$10 per ton (p. 116), at the old price, and there were some streaks much richer. Coastal Plain deposits cover much of the area around the Haile mine, and it is possible that the ore bodies extend underneath these deposits.

None of the low-grade disseminated deposits have yet been found in York County. Disseminated sulfides occur locally in the country rock at several of the mines, and some of the country rock possibly could be mined as ore along with vein material. Any exploration program should include adequate sampling of the country rock.

Gold production in York County has been mainly from quartz veins containing pyrite and "brown ore" (mainly weathered pyrite). Graton (1906), Sloan (1908), and Pardee and Park (1948) quote nearly forty apparently reliable assays and smelter returns, upon which the following conclusions are based. The few assays of country rock rarely run higher than \$5 per ton. White vein quartz with little pyrite generally assays less than \$10 per ton. Quartz with considerable pyrite in many cases has values between \$20 and \$100 per ton. Smelter returns and assays for sulfide concentrates from several different mines range from \$50 to \$250 per ton. Significant quantities of silver depend largely on the presence of galena in the ore. The ore values appear to be "spotty", with rich zones and lean zones, and the veins may pinch or swell in a short distance. For these reasons, careful exploration is necessary to prove adequate tonnage for a large operation.

The placer deposits occur in gravels along present stream valleys and in remnants of old stream gravels perched higher up the hillslopes. In addition, it appears that some of the placer deposits are in colluvial material that moves downslope under the influence of gravity and has not been affected by stream action. Typically, the alluvial and colluvial beds are three to six feet thick and overlie weathered but undisturbed country rock. The coarsest fragments, chiefly quartz, occur immediately above the weathered country rock, and the deposits grade upward into finer material. The gold would be expected to occur mainly in the coarse layer, at the contact between the country rock and overlying material.

Gold can be panned at numerous localities in the region, but to my knowledge very little systematic exploration has been undertaken of placer deposits. The Martin mine demonstrates that placer deposits in this region can be worth mining.

The following steps are suggested in the exploration of a potential placer deposit: (1) outlining the deposit by mapping, (2) sampling on a grid system by pits or drill holes that extend entirely through the deposit into country rock, (3) concentration of the samples by pan or sluice box, and (4) assaying of the concentrates.

The future of gold mining in South Carolina remains uncertain. The closing of the mines operating in 1942 was on government order and not because of lack of ore, but none has been returned to production. Most of the deposits have not been explored by modern means. South Carolina's potential for gold production has not been adequately tested.

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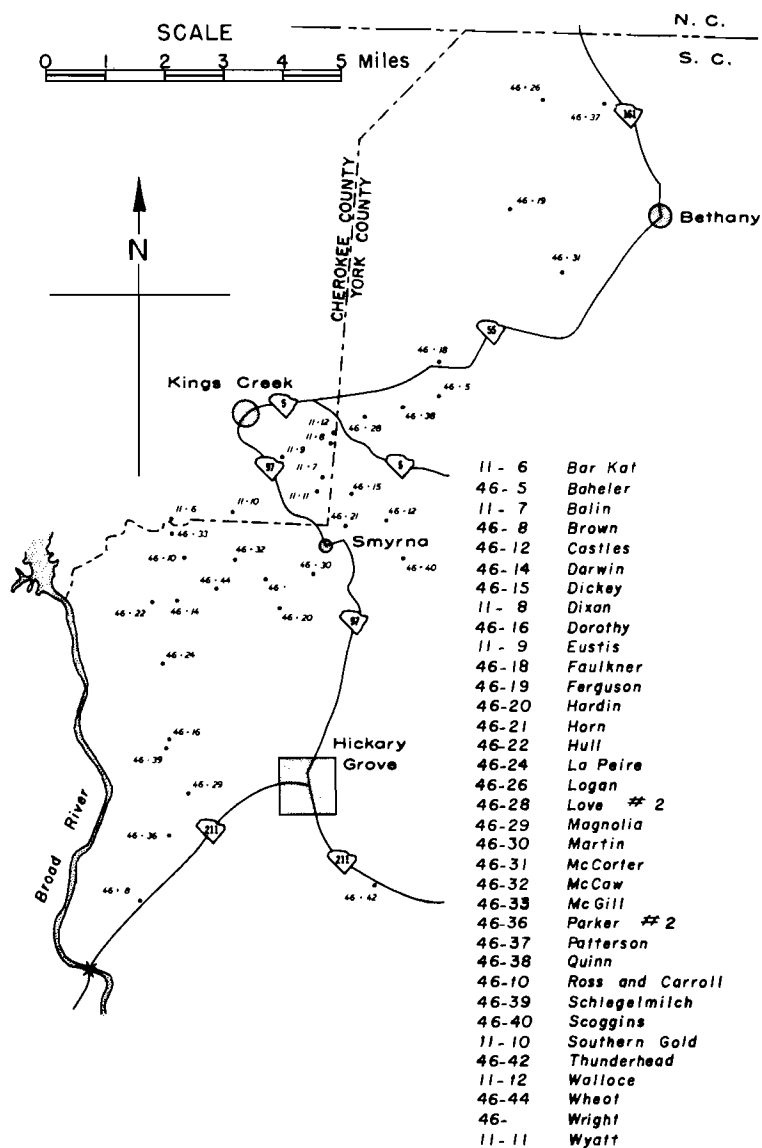


Fig. 2. Gold mines and prospects of the Smyrna area. Northern South Carolina.

Table 1. -- Gold localities of South Carolina. (Compiled by Camilla McCauley, 1963. Cherokee and York County localities revised by J. R. Butler, 1964.)

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
1	1-1	Abbeville	Calais and Douglas	8 miles S. 10° W. of Abbeville
2	1-2	Abbeville	Cook	3 miles S. 46° W. of Lowndesville
3	1-3	Abbeville	Hawk Woods	Unknown
4	1-4	Abbeville	Jones	5.8 miles S. 20° E. of Abbeville; west of Long Cane Creek
5	1-5	Abbeville	Lyon	7.3 miles S. 5° E. of Abbeville
6	4-1	Anderson	Henderson	6.4 miles S. 9° E. of Easley; 300 ft. north of Three and Twenty Creek
7	11-1	Cherokee	Flint Hill (Old Darwin)	9.5 miles SE of Gaffney; 1 mile west of Smith's Ford, Broad River
8	11-2	Cherokee	Love (Old Wilkey; Kennedy)	10.5 miles SE of Gaffney; 2 miles south of Flint Hill; SW of Smith's Ford
9	11-3	Cherokee	Love Springs (Old Palmer)	3 miles NE of Cowpens
10	11-4	Cherokee	Nott(Knott; old Austin Placer)	3.5 miles SW of Gaffney; near old Cameron Lead Mine
11	11-5	Cherokee	Spartan	Unknown
12	11-6	Cherokee	Bar Kat* (McGill)	3 miles W. of Smyrna on both sides of Beech Branch in Cherokee and York Counties
13	11-7	Cherokee	Bolin*	0.7 mile N. of Smyrna, W. of Canaan Church
14	11-8	Cherokee	Dixon*	1.7 miles N. of Smyrna
15	11-9	Cherokee	Eustis*	0.8 mile SE of Kings Creek Station
16	11-10	Cherokee	Southern Gold* (Terry)	2 miles W. of Smyrna
17	11-11	Cherokee	Wyatt*	0.7 mile N. of Smyrna, W. of Canaan Church
18	11-12	Cherokee	Wallace*	1.8 miles N. of Smyrna

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
19	13-1	Chesterfield	Brewer	1.5 miles west of Jefferson; 1 mile NE of junction of S.C. Highway 265 and County Road 110
20	13-2	Chesterfield	Edgeworth & Brewer	7 miles N.70°W. of Ruby
21	13-3	Chesterfield	Hendrix	3.9 miles N.87°W. of Ruby
22	13-4	Chesterfield	Kirkley	2.3 miles S.10°E. of Jefferson
23	13-5	Chesterfield	Leach	2 miles N.54°W. of Jefferson
24	13-6	Chesterfield	Oro	At Pageland
25	13-7	Chesterfield	Placer (Gregory)	2.3 miles N.55°W. of Jefferson
26	19-1	Edgefield	Landrum & Quattlebaum	12 miles north of Edgefield; 2.5 miles north of U. S. 378; east side of Sleepy Creek
27	23-1	Greenville	Desoto	3 miles NW of Princeton; on W side of Mountain Creek; 0.4 mile below Greenville Road bridge
28	23-2	Greenville	Fountain Inn	Near Fountain Inn on Laurens County line
29	23-3	Greenville	McBee #1	On Greenville-Spartanburg County line; 6.5 miles north of Greer on west side of Middle Tyger River
30	23-4	Greenville	McBee #2 (Carson)	6.5 miles north of Greer; on small creek 0.3 mile west of river bridge near county line
31	23-5	Greenville	Cureton	8 miles NW of Greer; 1 mile above Mc- Bee Mine on opposite side of river
32	23-6	Greenville	Westmoreland	11 miles north of Greenville; 0.6 mile south of Locust Hill
33	23-7	Greenville	Wild Cat	15 miles N.15°E. of Greenville
34	24-1	Greenwood	Bradley	2.5 miles SE of Verdery; 0.9 mile E of Greenwood-Augusta R.R.
35	24-2	Greenwood	Young	At Troy
36	28-1	Kershaw	Lamar	9 miles NW of Camden; 1 mile NE of Getty's bridge over Sawneys Creek

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
37	29-1	Lancaster	Belk	9 miles N.77°E. of Lancaster
38	29-2	Lancaster	Blackmon	8 miles N.5°E. of Kershaw
39	29-3	Lancaster	Brassington	3.6 miles NE of Kershaw next to Haile Mine
40	29-4	Lancaster	Clyburn (Gay)	1.5 miles north of Kershaw
41	29-5	Lancaster	Davis	Unknown
42	29-6	Lancaster	Funderburk	8 miles NW of Jefferson
43	29-7	Lancaster	Gold Hill (Nisbet)	2 miles west of Osceola
44	29-8	Lancaster	Hagin	4 miles NW of Osceola
45	29-9	Lancaster	Haile	3 miles NE of Kershaw
46	29-10	Lancaster	Hegeler	Unknown
47	29-11	Lancaster	Ingram	4.5 miles S.76°W. of Jefferson
48	29-12	Lancaster	Izell	3 miles north of Osceola
49	29-13	Lancaster	Johnson (Strand)	9.5 miles east of Lancaster
50	29-14	Lancaster	Knights	9 miles N.69°W. of Jefferson
51	29-15	Lancaster	Phiffer	7 miles north of Kershaw
52	29-16	Lancaster	Redding	3 miles NE of Heath Springs
53	29-17	Lancaster	Stevens	6 miles N.79°E. of Lancaster
54	29-18	Lancaster	Stroud	10 miles east of Lancaster
55	30-1	Laurens	Mt. Olive	7 miles W. of Waterloo; on W. side of road on high ridge between Saluda and Reedy Rivers
56	30-2	Laurens	Raeburn Creek	8 miles S.35°W. of Laurens
57	35-1	McCormick	Butler	3 miles south of McCormick
58	35-2	McCormick	Dorn	At McCormick
59	35-3	McCormick	Jennings	3 miles SW of McCormick
60	35-4	McCormick	Link	2 miles south of Beulah Crossroads
61	35-5	McCormick	Neill (Neel)	0.5 mile SE of Beulah Crossroads; 9 miles south of Abbeville

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
62	35-6	McCormick	Searles	5.5 miles SW of McCormick
63	35-7	McCormick	Self	2.5 miles south of McCormick
64	35-8	McCormick ?	Smith	Near McCormick (Possibly same mine as 24-2)
65	36-1	Newberry	Lesters ?	4 miles SW of Prosperity next to Bush River
66	37-1	Oconee	Cochran (Lawton)	3 miles SW of Adams Crossing
67	37-2	Oconee	Cox	4 miles north of Pulaski; 10 miles NW of Fort Madison
68	37-3	Oconee	Henckel	14 miles west of Walhalla; on eastern scarp of Chatooga R. 1 mile west of Rogues Ford
69	37-4	Oconee	Jesse Lay	11.5 miles north of Walhalla
70	37-5	Oconee	Keowee River	Between White Water & Toxaway Rivers
71	37-6	Oconee	Kuhtman (Old Cheohee)	15 miles north of Walhalla on Middle Fork of Cheohee Creek
72	37-7	Oconee	Pickens	1.5 miles SW of Cherry
73	37-8	Oconee	Sitton	5.5 miles south of Seneca
74	37-9	Oconee	Sloan	0.2 mile north of Keowee Station
75	39-1	Pickens	Calhoun	1 mile north of Calhoun
76	41-1	Saluda	Culbreath	12 miles north of Newberry; in fork of Big Creek & Little Saluda Rivers
77	41-2	Saluda	Yarborough	5½ miles NNE of Saluda east of S.C. Highway 19, ½ mile NE of junction of roads 31 & 43
78	42-1	Spartanburg	Hammet	3.8 miles SE of Cowpens
79	42-2	Spartanburg	Jackson	Unknown
80	42-3	Spartanburg	Wolf & Tyger	7 miles north of Greer along east bank of Middle Tyger River near county line

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
81	44-1	Union	Bogan	8 miles N.72°W. of Union
82	44-2	Union	Mud (Harman)	3.8 miles S.77°E. of Glenn Springs
83	44-3	Union	Nott	3 miles east of Glenn Springs
84	44-4	Union	Ophir (Thompson)	5 miles SE of Glenn Springs; 1.2 miles SE of West Springs
85	44-5	Union	West	6 miles S.60°E. of Glenn Springs
86	46-1	York	Allison	4 miles west of Clover
87	46-2	York	Almathea**	Near Smyrna - exact location unknown
88	46-3	York	Arrowwood**	4.6 miles NW of Hickory Grove
89	46-4	York	Barnett	10 miles NE of York; 2 mi. NW of Nanny's Mtn.
90	46-5	York	Boheler*	3.0 miles N.35°E. of Smyrna
91	46-6	York	Bolin**	5 miles south of Kings Creek Station
92	46-7	York	Bradley**	0.5 mile SE of London Station
93	46-8	York	Brown*	3.2 miles SW of Hickory Grove
94	46-9	York	Campbell	13.5 miles NE of York; 1.5 mi. NE of Jingles
95	46-10	York	Carroll & Ross (Wolf Creek)*	3 miles SW of Kings Creek; 3 miles W. of Smyrna
96	46-11	York	Cassady**	1.2 miles SW of Smyrna
97	46-12	York	Castles*	One mile NE of Smyrna
98	46-13	York	Clawson (Sutton)	4 miles NW of Fort Mill
99	46-14	York	Darwin*	5 miles south of Kings Creek Station; 3.0 miles WSW of Smyrna; ½ mi. S. of Carroll and Ross
100	46-15	York	Dickey (Allison)*	0.7 mile N. of Smyrna, E. of Canaan Church
101	46-16	York	Dorothy*	4.4 miles SW of Smyrna; NE of Schlegel- milch

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
102	46-17	York	Ellis**	6.5 miles N.25°E. of Smyrna; 1.3 mi. NE of Ferguson
103	46-18	York	Faulkner*	3.5 miles NE of Smyrna
104	46-19	York	Ferguson*	5.7 miles SE of Grover; 2 mi. SE of Kings Mountain Battleground; 5.5 mi. NE of Smyrna
105	46-20	York	Hardin*	1.5 miles SW of Smyrna
106	46-21	York	Horn*	Smyrna Station; 0.2 mi. N. of Smyrna
107	46-22	York	Hull*	3.5 miles W. of Smyrna
108	46-23	York	Jingles (Biddle)	12 miles NE of York; 2½ mi. NE of Barnett
109	46-24	York	La Peire*	3.7 miles SW of Smyrna; 1¼ mi. S. of Darwin
110	46-25	York	Little Wilson	5 miles NE of York; 1 mi. SW of Wilson
111	46-26	York	Logan*	6.5 miles NE of Smyrna
112	46-27	York	Love #1	2.5 miles NE of York near Wallace property
113	46-28	York	Love #2*	2.2 miles N. of Smyrna
114	46-29	York	Magnolia (Smith; Old Louise)*	2.2 miles W. of Hickory Grove on Smith's Ford Road; at head of a branch of Guyonmoore Creek
115	46-30	York	Martin (Cathryn; Enterprise)*	0.5 mile west of Smyrna
116	46-31	York	McCarter*	6 miles NE of Smyrna
117	46-32	York	McCaw*	2 miles W. of Smyrna
118	46-33	York	McGill (Bar Kat)*	2.5 miles south of Kings Creek Station
119	46-34	York	Mercer**	1.5 miles west of Hickory Grove
120	46-35	York	Parker #1**	0.4 mile SE of Magnolia
121	46-36	York	Parker #2*	0.8 mile SE of Magnolia Mine
122	46-37	York	Patterson*	

<u>No.</u>	<u>Code</u>	<u>County</u>	<u>Name</u>	<u>Location</u>
123	46-38	York	Quinn*	2.5 miles NNW of Smyrna
124	46-39	York	Schlegelmilch*	4.4 miles SW of Smyrna, SW of Dorothy
125	46-40	York	Scoggins*	1 mile E. of Smyrna
126	46-41	York	Smith**	3 miles SW of Smyrna
127	46-42	York	Thunderhead*	1.5 miles SE of Hickory Grove
128	46-43	York	Wallace	3.5 miles NE of York
129	46-44	York	Wheat*	2.3 miles WSW of Smyrna
130	46-45	York	Whisenant**	6 miles SW of Kings Creek Station
131	46-46	York	Wilson	6 miles NE of York

* Mines and prospects of the Smyrna area shown on Figure 2.

** Mines and prospects of the Smyrna area which are not shown on Figure 2 because they could not be accurately located.

